Climate Change Risks and Consequences on Growth, Poverty and Debt Sustainability in Africa

Abebe Shimeles,
Director of Research

African Economic Research Consortium

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Outline of presentation

1. Introduction: background and context
2. Overview of climate risks and shocks in Africa
3. Impact of climate shocks on debt trajectories
4. Transition to a low-carbon economy: costs and benefits
5. Conclusions and policy implications

Introduction

1. We are at the cusp of experiencing climate change induced catastrophe that could be irreversible.
2. The transition to green energy sources is needed with urgency and scale to stem the risk of climate change related shocks.
3. The evidence suggests that Africa contributes less than 3% of total global greenhouse gas (GHG) emissions yet suffers the most from climate change shocks.
4. The main factors that have exposed African countries to climatic shocks include the source of livelihood, which is predominantly from agriculture that on the average employs over 55% of the work force and contributes close to 20% of GDP.
5. Africa is dependent on fossil fuels, and less than 40% of Africans have access to electricity and clean cooking solutions
6. Hence, transitioning to low-carbon pathways will come at a heavy cost.

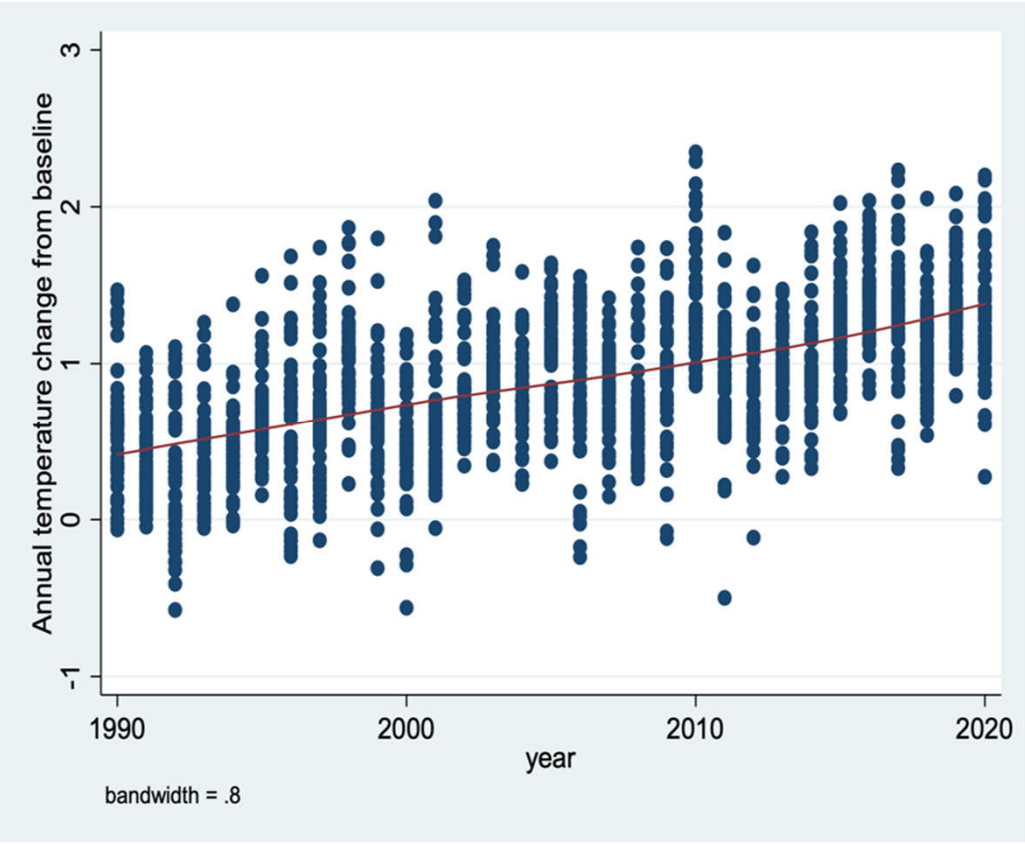
Plan of this presentation

1. To present the effects of climate change on growth, debt sustainability, and poverty in Africa
2. This implies that the policy trajectory in Africa will be influenced and perhaps driven by the effects climate change.
3. Perhaps the effects of climate change have been ignored in the past – it may explain the perverse policy outcomes – Central Banks fighting inflation from the supply side shocks induced by climate change
4. Explore the pathways to transition to low-carbon economy
5. Draw the implications for global policy coordination

Overview of climate risks and shocks in Africa/1

- Average temperature has been rising rapidly and steadily in Africa crossing the one-degree centigrade mark in 2010 (Fig.1).
- If the situation continues untamed, the disruptions that could follow on the economy could be significant.

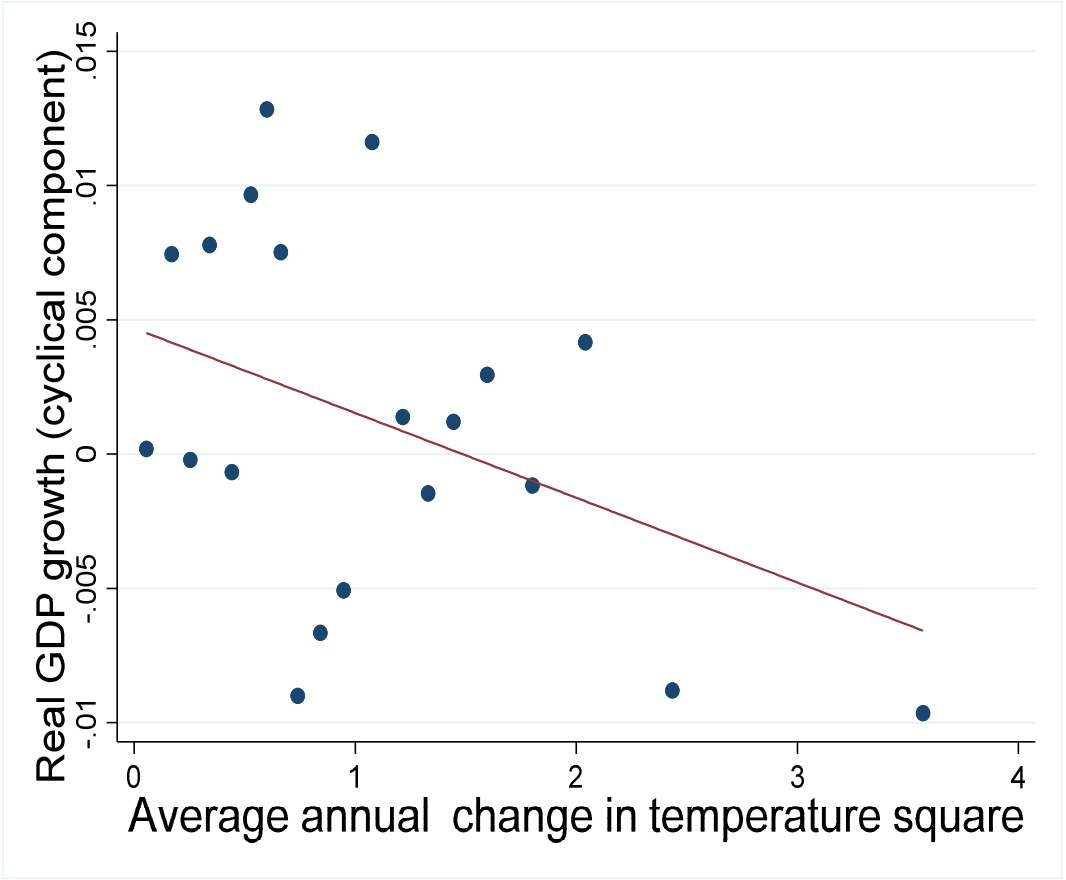
Figure 1: Average temperature changes in degree centigrade in Africa



Impact of climate shocks on real GDP growth

- Rising temperature in Africa tend to reduce real GDP growth (the cyclical component) after a certain threshold (annual change of temperature beyond 0.7 degree centigrade).
- Temperature increases at 1.8 degree centigrade which is expected to prevail by 2030 (if current trends persist) could lead to a 2-percentage point decline in real GDP growth.

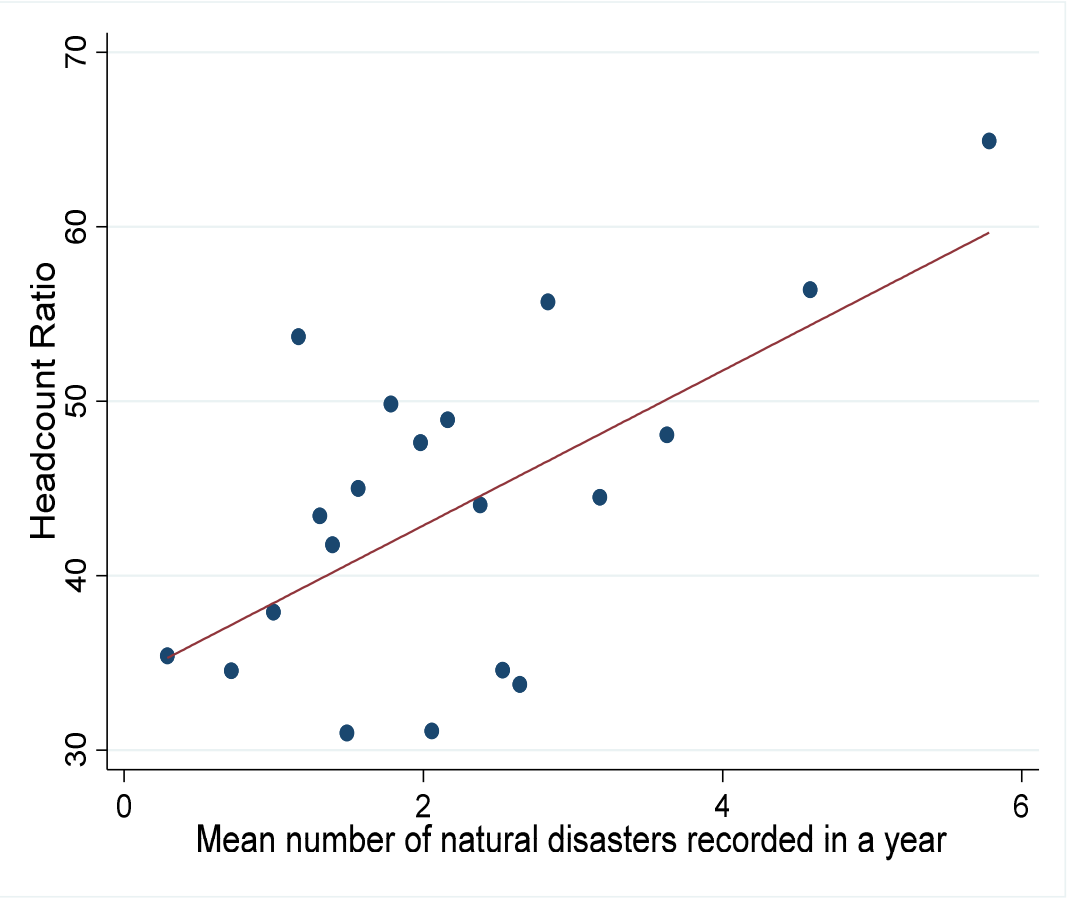
Figure 2: Real GDP growth and average temperature in Africa



Impact of climate shocks on real GDP growth

- Figure 3 illustrates the strong association between extreme poverty and frequency of natural disasters in Africa after controlling for variations in real GDP, government fiscal space and overall governance (government effectiveness, corruptions, rule of law, etc.,).
- Accordingly, an increase of natural disaster frequency by one unit would increase the percentage of households living under extreme poverty by 4.4 percentage point.

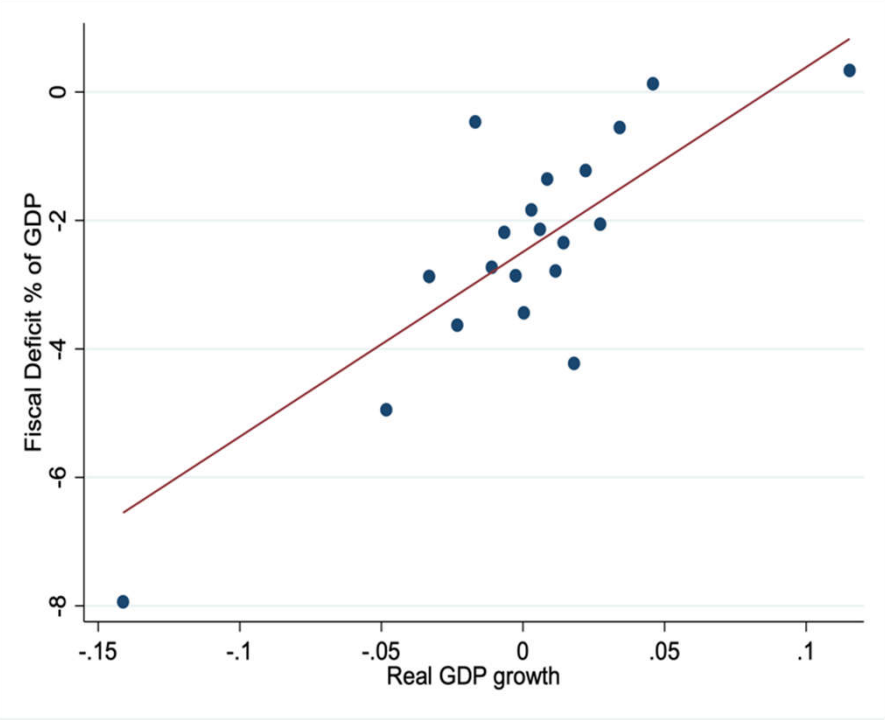
Figure 3: Natural disaster and poverty in Africa



Climate change and the debt burden

- Figure 5 presents robust and positive correlation between real GDP growth and fiscal deficit in Africa showing that growth losses would worsen fiscal deficit and vice versa.
- Based on historical trends, we estimate the 'optimal' debt-burden for Africa to be around 73% of GDP.
- Combining the shift in real GDP growth caused by climate change induced shocks with the budget deficit, we estimate that climate change could increase the debt-GDP ratio to about 175% of GDP.

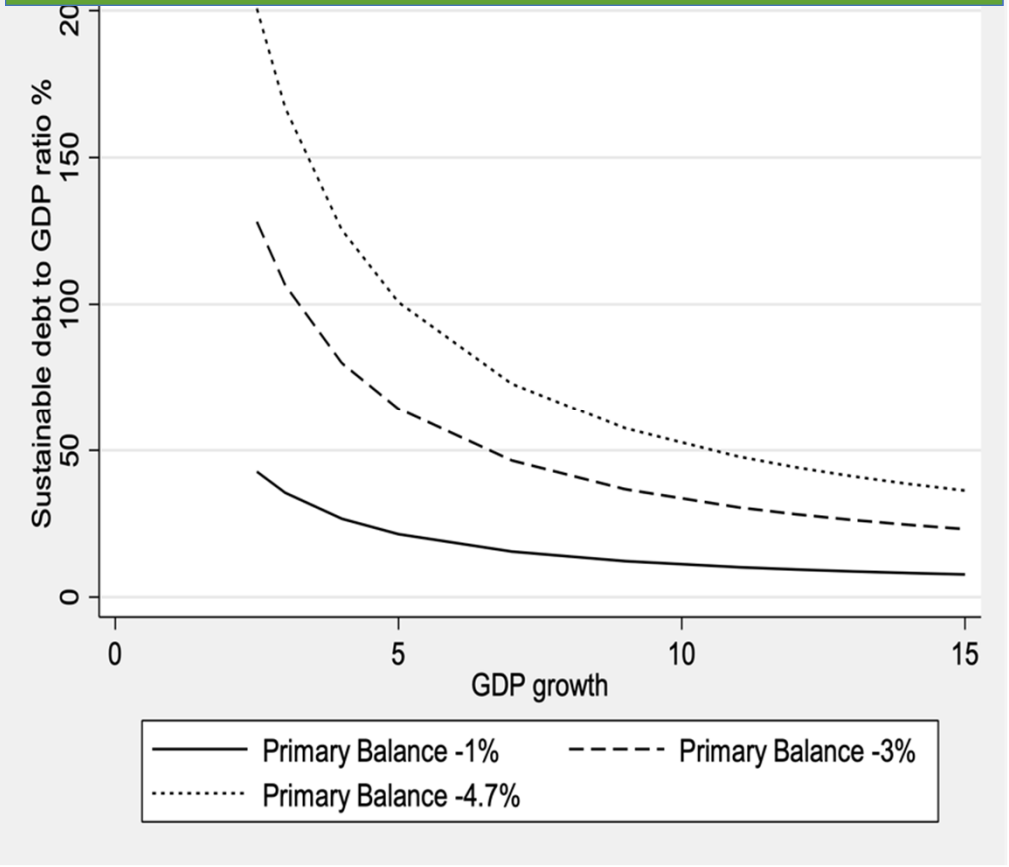
Figure 4: Correlation between fiscal deficit/surplus and real GDP growth in Africa



Impact of climate shocks on debt trajectories

- Figure 3 illustrates that the steady-state debt-burden declines with GDP growth and increases with government budget deficit.
- It shows that protecting steady-state GDP growth from falling below 5% is very helpful in reducing the steady-state debt level.
- On the other hand, faster growth above 7% is less impactful on the steady-state debt level, which implies better fiscal space even when running higher deficits.

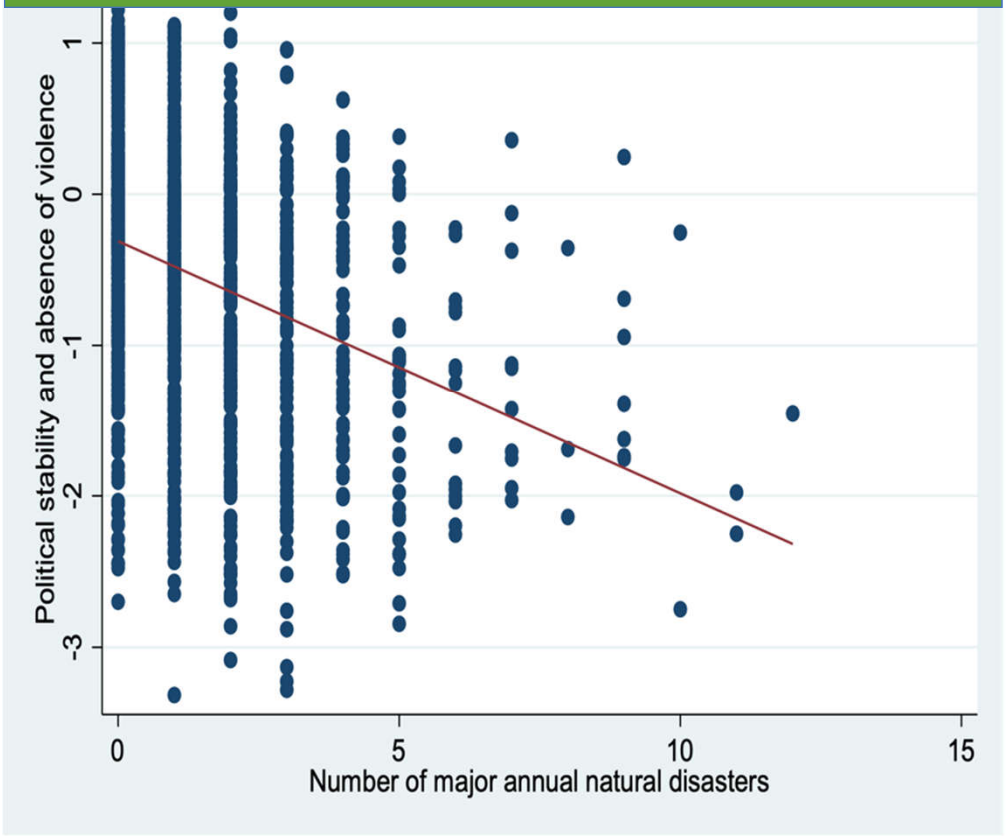
Figure 5: Debt burden and real GDP growth for alternative levels of budget deficit



Overview of climate risks and shocks in Africa/2

- Figure 6 presents the correlation between the number of major natural disasters recorded in Africa every year since the 1990s and incidence of conflict and political instability.
- Preliminary correlations show that a 1% increase in per capita CO2 emissions is correlated with around 0.75% increase in natural disasters, further solidifying the link between natural disasters and climate change.

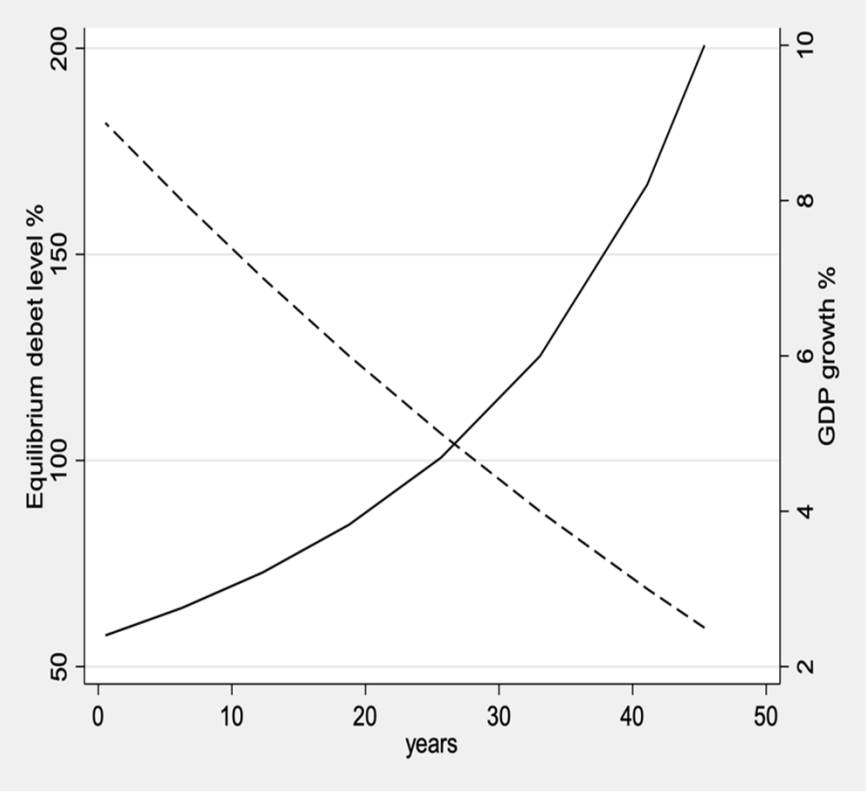
Figure 6: Number of major natural disasters and political instability/conflict in Africa



Impact of climate shocks on debt (cont'd)

- Figure 7 shows the relationship between the GDP growth rate that is assumed to prevail for the computed steady-state debt-GDP ratio and the number of years it takes to fully pay off debt.
- It shows that the lower the GDP growth (the higher the steady-state debt-GDP ratio), the longer also it takes for a country to clear its debt.
- Faster growth means that a country could afford to run larger deficits and still manage to pay off its debt.
    - E.g., for shorter term loans, e.g., that to be paid in about 10 years, the steady-state debt-GDP ratio could reach up to 70% provided the economy grows at 7% and so forth.

Figure 7: Even when debt is sustainable, it would take years to clear arrears with sluggish growth



The Just Energy Transition & Implications to Africa

- Table 2 shows that the carbon tax leads a contraction in the GDP of Nigeria (-0.10%) and South Africa (-0.58%) but has a small positive effect (0.03%) on that of Egypt.
- The tax leads to rises in the prices of energy-intensive products and services such coal, gas, and electricity, which causes private consumption expenditure to decline in all three countries.
- This in turn leads to declines in real income (measured by equivalent variation)
- CO_2 emissions fall in all 3 countries, suggesting that carbon pricing could be an effective means of reducing emissions to meet the NDCs.

Table 1: Macroeconomic impacts of carbon pricing in Nigeria, South Africa, and Egypt

Variable	Nigeria	South Africa	Egypt
GDP (% change)	-0.10	-0.58	0.03
Private consumption (% change)	-0.01	-0.26	-0.04
Exports (% change)	0.18	0.71	0.36
Imports (% change)	-0.26	-1.78	-0.14
Terms of trade (% change)	-0.04	-0.10	-0.05
Trade balance (US$ mil.)	357.90	2888.28	308.15
CO_2 emissions (% change)	-2.78	-13.21	-6.79
Welfare (based on EV, US$ mil.)	-44.06	-805.83	-125.11

Conclusions /1

- We have shown that climate shocks could have a direct effect on government fiscal position and subsequently on sustainability of debt.
- For example, a 1% decline in real GDP growth could worsen the budget deficit by 0.3 percentage points, and this could increase the debt-burden by 2.4 times. Current initiatives (climate change debt swap; reallocating SDRs, etc are not sufficient) require a significant overhauling including reforming the DSA currently in use by IMF and design of article IV consultations.
- Our modelling results indicate that carbon pricing could be an effective way of meeting the NDCs. However, carbon pricing (like a carbon tax) would have negative impacts on energy-intensive industries and increase the prices of the goods and services they provide.

Conclusions /2

- The combined effect of these impacts could be a reduction in GDP growth and real incomes.

- From the modelling results, we infer that carbon pricing can have regressive effects, particularly on low-income households, if not well designed.

Policy implications /1

- To attract the needed investment required to exploit Africa's renewable resources, African governments should develop a stable regulatory and policy environment and establish competitive pricing to promote mini-grid solutions and standalone systems.

- Participation in international carbon markets and offset schemes (e.g., REDD+, CDM) requires a credible system for measuring, reporting, and verifying emissions, which is lacking in many African countries.

- More capacity building and technical assistance is required to undertake these tasks.

Policy implications /2

- Improvements are needed in forest governance and in land tenure systems
- In the transition to low-carbon pathways, the world would need African resources. Therefore, there is a need to ensure that sustainable extraction techniques are used, and fair employment practices are enforced.
- Regional collaboration and leadership is required for Africa to participate meaningfully in global and regional carbon markets
- E.g., regional collaboration is required to amend and enhance legal frameworks to facilitate implementation and administration of the scheme

THANK YOU